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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
|-----------------|-------------|----------------------|---------------------|

09/453,319 12/02/99 SHEPARD

S 64631-0020

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EXAMINER

VERBITSKY, G

ART UNIT

PAPER NUMBER

2859

DATE MAILED:

02/13/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

| | | |
|--------------------------------------|--|---|
| Application No. 09/453,319 | Applicant(s) Gail V. Rbitsky | Shepard |
| Examiner Gail V. Rbitsky | Group Art Unit 2859 |  |

- Responsive to communication(s) filed on _____
- This action is FINAL.
- Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle* 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

- Claim(s) 1-28 is/are pending in the application.
- Of the above, claim(s) _____ is/are withdrawn from consideration.
- Claim(s) _____ is/are allowed.
- Claim(s) _____ is/are rejected.
- Claim(s) 1-28 is/are objected to.
- Claims _____ are subject to restriction or election requirement.

Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The drawing(s) filed on _____ is/are objected to by the Examiner.
- The proposed drawing correction, filed on _____ is approved disapproved.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- All Some* None of the CERTIFIED copies of the priority documents have been
- received.
- received in Application No. (Series Code/Serial Number) _____.
- received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- Notice of References Cited, PTO-892
- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- Interview Summary, PTO-413
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for domestic priority under 35 U.S.C. 119(e).

Claim Objections

2. Claims 7, 15, 20 and 23 are objected to because of the following informalities:

A) Claim 15: Perhaps applicant should replace "the specimen surface" in line 4 with --a surface of the specimen-- . In this case, "a" in line 5 should be replaced with --the--, in order to provide a proper antecedent basis,

B) Claims 20 and 23: "said distorting means" in line 1 of claim 20 and 23 lacks antecedent basis,

C) Claim 7: 1. "the pressure" in line 2 lacks antecedent basis. Perhaps applicant should replace all occurrences of "pressure" in claim 7 and all dependent on it claims with --force-- in order to be compliant with claim 1. Furthermore, applicant should note that in formulating the rejection on the merit of claim 7, it has been considered that the "force" and "pressure" are Appropriate correction is required.

2. "the first and second active thermographic images" in lines 4-5 lacks antecedent basis.

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Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 6 and 7-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In this case,

A) Claim 6: “said generating step” in line 2 makes the claim language confusing because, both, claim 5 and claim 1 (which claim 6 is dependent on), introduce different *generating steps*. Claim 1 introduces *an image generating step*, and claim 5 introduces *a vacuum generating step*. Perhaps applicant should replace “said generating step” in line 2 of claim 6 with --said vacuum generating step-- in order to clearly describe the invention. Is this a proper interpretation of the invention?

B) Claims 7-14: the claim language is confusing due to the reason stated above in paragraph 2. Appropriate clarification and correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebeau et al. 5201841 [hereinafter Lebeau] in view of Cramer et al. [hereinafter Cramer].

Lebeau discloses in Fig. 1 a device comprising a heat source 27 directed onto a sample/specimen 11, means for sensing temperature 29, an impact source (force) 26 for mechanical disturbance which can be an ultrasound source (col. 3, line 22). The mechanical disturbance is being monitored over the time. It is known that the speed the mechanical waves travel through the known material (sample) is a function of temperature (col. 3, lines 3-7). The temperature changes (thermal image) are recorded as heat is transferred through a bond area (col. 1, lines 57-58).

Lebeau does not explicitly disclose that the means for sensing temperature is able to generate a thermal video image.

Cramer discloses a device comprising a thermal imager (infrared radiometer) 30 recording a plurality (first and second) of thermal images per unit area over time (col. 9, lines 56-57). Cramer also discloses a constant surface temperature heater 10. A material defect produces deviation from the constant surface temperature. The imager generates a video image of thermal characteristics of the test surface of a specimen.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the thermal imager in the device disclosed by Lebeau with the thermal video imager, as taught by Cramer, to be able to be able to generate a video information

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of the thermal characteristics of the specimen, as already suggested by Cramer and well known in the art.

It would have also been obvious to provide the specimen of the device disclosed by Leveau with a constant temperature heater, as taught by Cramer, in order to uniformly heat the specimen and detect the deviations of temperature (lack of uniformity) produced by the material defects, as already suggested by Cramer and well known in the art.

7. Claims 2, 4-6, 15-16, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leveau and Cramer as applied to claims 1, 3, 18 above, and further in view of Rose and Cielo et al. [hereinafter Cielo].

Leveau and Cramer disclose the device as stated above in paragraph 6.

They do not specifically disclose applying decreased air pressure onto a specimen as stated in claim 2 and other limitations of claims 4-6, 15-16 and 23.

Rose discloses a device comprising a sample 2, a heat source (laser) providing heating of the sample with a pulsed beam. The sample is mounted on a base block 16 which with a gas cell 20 mounted onto a surface A of the specimen form a gas tight chamber (sealed enclosure) 24 containing the specimen and having a sealed transparent window to allow radiation in. A microphone 22 is mounted in the housing to sense acoustic waves generated by change in gas pressure within the chamber (the numeral A has been added by the Examiner).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to place the specimen disclosed by Leveau and Cramer in a sealed chamber with a window, as taught by Rose, in order to be able to regulate the pressure (change stress applied to the specimen) in the chamber, as already suggested by Rose and very well known in the art.

Although, discloses changing pressure in the chamber, Rose does not disclose vacuum in the chamber to exacerbate deformation or disbond.

Cielo states that it is known in the art that deformation (defect) of a coating (laminated) layer can be produced by either vacuum (decreased air pressure), vibration or surface heating (col. 1, lines 54-56) in order to evaluate the specimen. Inherently, in order to generate vacuum, one needs to have a vacuum source (vacuum pump).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to produce deformation of the coating layer of the specimen disclosed by Leveau, Cramer and Rose, by reducing the air pressure, as taught by Cielo, as already suggested by Cielo and well known in the art.

It would have also been obvious to one of ordinary skill in the art to add a vacuum pump, as taught by Cielo, to the device disclosed by Leveau, Cramer and Rose in order to be able to regulate the pressure inside the chamber, as very well known in the art.

With respect to claim 6: having a sealed enclosure divided onto two parts, absent any criticality, is only considered to be an obvious modification of shape of the device disclosed by

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Leveau, Cramer, Rose and Cielo because the courts have held that a change in shape or configuration, without any criticality, is within the level of skill in the art as the particular shape claimed by applicant is nothing more than one of numerous shapes that a person having ordinary skill in the art will find obvious to provide for the sealing chamber disclosed by Rose.

In re Dailey, 149 USPQ 47 (CCPA 1976).

8. Claims 19-22 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leveau, Cramer, Rose and Cielo as applied to claims 1-6, 15-16 and 23 above, and further in view of Thermography and Ultrasonic Finds Flaws in Composites article, 1993 [hereinafter Article].

Leveau, Cramer, Rose and Cielo disclose the device as stated above in paragraphs 6-7.

They do not disclose the limitations of claims 19-22 and 24-26.

Article discloses a device comprising a flash lamp as a heater.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the heater disclosed by Leveau, Cramer, Rose and Cielo with a flash lamp, as taught by Article, because both of them are alternate types of heaters which will perform the same function of directing light/heat onto the specimen in order to heat the specimen, if one is replaced with the other.

With respect to the particular location of the heater/flash lamp, such as inside or outside the chamber, as stated in claims 22, 25 and 26: It would have been obvious to one of ordinary

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skill in the art at the time the invention was made to relocate the heater of the device disclosed by Leveau, Cramer, Rose and Cielo inside/outside the chamber, since it has been held that rearranging parts of the invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

With respect to the particular location of the imager such as inside or outside the chamber, as stated in claim 26: It would have been obvious to one of ordinary skill in the art at the time the invention was made to relocate the imager of the device disclosed by Leveau, Cramer, Rose and Cielo inside/outside the chamber, since it has been held that rearranging parts of the invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

9. Claims 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebeau and Cramer as applied to claims 1, 3, 18 above, and further in view of White et al. [hereinafter White].

Lebeau and Cramer disclose the device as stated above in paragraph 6.

They do not disclose a heat lamp as a heater.

White discloses a device comprising a heat lamp (col. 4, line 31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the heater used by Lebeau and Cramer with a heat lamp, as taught by White, because both of these device are alternate types of heaters which will perform the same function of heating the specimen, if one is replaced with the other.

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With respect to an attachment to apply (couple/conduct) a force to the specimen as stated in claim 27: It is very well known in the art that a media such as an air is considered to be a coupling media/agent (attachment) to transmit (couple) a disturbance such as ultrasound waves to an object (specimen). Therefore, an air path disclosed by Lebeau and Cramer between the ultrasound and the specimen, in a broad sense, can be considered a coupling media (attachment).

Allowable Subject Matter

3. Claims 7-14 and 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 and not mentioned above disclose related devices.

5. Any inquiry concerning this communication should be directed to Examiner Verbitsky whose telephone number is (703) 306-5473.

Any inquiry related to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

GKV

January 17, 2001

*G. BRADLEY BENNETT
PRIMARY EXAMINER
AV 2859*

US005587532A

United States Patent [19]
Rose

[11] Patent Number: 5,587,532
[45] Date of Patent: Dec. 24, 1996

[54] METHOD OF MEASURING CRACK PROPAGATION IN OPAQUE MATERIALS

[75] Inventor: Douglas N. Rose, Macomb County, Mich.

[73] Assignee: The United States of America as represented by the Secretary of the Army, Washington, D.C.

[21] Appl. No.: 371,719

[22] Filed: Jan. 12, 1995

[51] Int. Cl. 6 G01N 29/04

[52] U.S. Cl. 73/579; 73/571

[58] Field of Search 73/571, 587, 606, 73/643; 250/492.1, 492.2, 492.3; 374/5; 356/432

[56] References Cited

U.S. PATENT DOCUMENTS

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4,267,732 5/1981 Quate 73/606
4,543,486 9/1985 Rose 73/606
4,562,736 1/1986 Iwasaki 73/587

Primary Examiner—Hezron E. Williams

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Attorney, Agent, or Firm—Peter A. Taucher; Gail S. Soderling

[57]

ABSTRACT

A microscopy-thermal wave microscopy apparatus for measuring crack propagation resistance based on the lateral crack system induced by forming a hardness indentation in an opaque material the resistance and crack extent providing a quantitative measure of the spalling propensity of the opaque material.

1 Claim, 1 Drawing Sheet

